

### **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listing of claims in the above-referenced application.

#### **Listing of Claims:**

1. – 180. (Cancelled)

181. (Currently Amended) A method for detecting an event on a wire comprising:

processing a received waveform in accordance with signal propagation modeling in said wire producing a processed waveform;

fitting each of a plurality of functions to a portion of data points representing said processed waveform, wherein each of said plurality of functions is a localized curve fitting of said portion of data points that approximates values of the data points in the portion;

~~determining a characteristic for each of said plurality of functions;~~

~~evaluating said characteristic of each of said plurality of functions at data points representing said processed waveform; and~~

detecting an event using ~~[[said]]~~ a characteristic of said processed waveform ~~each of said plurality of functions.~~

182. (Previously Presented) The method of Claim 181, further comprising:

compensating said received waveform prior to said fitting a plurality of functions.

183. (Previously Presented) The method of Claim 181, wherein the event is one of: a connector, a cut, a nick, a crimp, damage to wire insulation due to age, damage to wire insulation due to coupling of the wire with another element.

184. (Previously Presented) The method of Claim 181, further comprising:  
storing data of said waveform in accordance with said event detected.

185. (Previously Presented) The method of Claim 181, further comprising:  
classifying said event.

186. (Currently Amended) ~~The method of Claim 181,~~ A method for detecting an event on a wire comprising:

processing a received waveform in accordance with signal propagation modeling in said wire producing a processed waveform;

fitting each of a plurality of functions to a portion of data points representing said processed waveform;

determining a characteristic for each of said plurality of functions;

evaluating said characteristic of each of said plurality of functions at data points representing said processed waveform; and

detecting an event using said characteristic of each of said plurality of functions,

wherein said portion of data points has  $N+M+1$  data points,  $N$  representing a number of data points prior to a first one of said data points included in said portion,  $M$  representing a number of data points after said first one of said data points included in said portion, and the method further comprising:

determining a first of said plurality of functions in accordance with said  $N+M+1$  data points.

187. (Currently Amended) The method of Claim ~~[[181]]~~ 211, further comprising:

determining an event detection threshold.

188. (Previously Presented) The method of Claim 187, further comprising:

determining at least one peak using said characteristic that exceeds said event detection threshold;

storing data corresponding to said at least one peak; and

classifying said data as one of a plurality of events.

189. (Currently Amended) The method of claim ~~[[181]]~~ 211, wherein said characteristic is a derivative.

190. (Previously Presented) The method of claim 189, wherein said derivative is a first derivative.

191. (Previously Presented) The method of claim 189, wherein said derivative is a second derivative.

192. (Previously Presented) The method of claim 181, wherein said function is a polynomial function.

193. (Currently Amended) A computer program product for detecting an event on a wire comprising:

executable code that processes a received waveform in accordance with signal propagation modeling in said wire producing a processed waveform;

executable code that fits each of a plurality of functions to a portion of data points representing said processed waveform, wherein each of said plurality of functions is a localized curve fitting of said portion of data points that approximates values of the data points in the portion;

~~executable code that determines a characteristic for each of said plurality of functions;~~

~~executable code that evaluates said characteristic of each of said plurality of functions at data points representing said processed waveform; and~~

executable code that detects an event using ~~[[said]]~~ a characteristic of said processed waveform ~~each of said plurality of functions.~~

194. (Previously Presented) The computer program product of Claim 193, further comprising:

executable code that compensates said received waveform prior to said fitting a plurality of functions.

195. (Previously Presented) The computer program product of Claim 193, wherein the event is one of: a connector, a cut, a nick, a crimp, damage to wire insulation due to age, damage to wire insulation due to coupling of the wire with another element.

196. (Previously Presented) The computer program product of Claim 193, further comprising:  
executable code that stores data of said waveform in accordance with said event detected.

197. (Previously Presented) The computer program product of Claim 193, further comprising:  
executable code that classifies said event.

198. (Currently Amended) ~~The computer program product of Claim 193,~~ A computer program product for detecting an event on a wire comprising:

executable code that processes a received waveform in accordance with signal propagation modeling in said wire producing a processed waveform;

executable code that fits each of a plurality of functions to a portion of data points representing said processed waveform;

executable code that determines a characteristic for each of said plurality of functions;

executable code that evaluates said characteristic of each of said plurality of functions at data points representing said processed waveform; and

executable code that detects an event using said characteristic of each of said plurality of functions, wherein said portion of data points has  $N+M+1$  data points,  $N$  representing a number of data points prior to a first one of said data points included in said portion,  $M$  representing a number of data points after said first one of said data points included in said portion, and the computer program product further comprising:

executable code that determines a first of said plurality of functions in accordance with said  $N+M+1$  data points.

199. (Currently Amended) The computer program product of Claim [[193]] 212, further comprising:

executable code that determines an event detection threshold.

200. (Previously Presented) The computer program product of Claim 199, further comprising:

executable code that determines at least one peak using said characteristics that exceed said event detection threshold;

executable code that stores data corresponding to said at least one peak; and

executable code that classifies said data as one of a plurality of events.

201. (Currently Amended) A method for detecting an event on a wire comprising:

fitting each of a plurality of functions to a portion of data points representing a received waveform, wherein each of said plurality of functions is a localized curve fitting of said portion of data points that approximates values of the data points in the portion;

determining a characteristic for each of said plurality of functions;

evaluating said characteristic of each of said plurality of functions at data points representing said received waveform; and

detecting an event using said characteristic of each of said plurality of functions, wherein, if said event indicates a fault condition of said wire, said characteristic is used to identify a type of fault condition.

202. (Currently Amended) A method for detecting an event on a wire comprising:

fitting each of a plurality of polynomials to a portion of data points representing a received waveform, said portion of data points including a number of data points in accordance with a selected window size, wherein the data points included in said portion include a designated data point and a specified number of data points relative to said designated data point;

determining a characteristic for each of said plurality of polynomials;

evaluating said characteristic of each of said plurality of polynomials at data points representing said received waveform; and

detecting an event using said characteristic of each of said plurality of polynomials.

203. (Currently Amended) A method for detecting an event on a wire comprising:

fitting each of a plurality of functions to a portion of data points representing a received waveform, wherein said fitting is a localized curve fitting technique utilized to smooth said data points;

determining a derivative for each of said plurality of functions;

evaluating said derivative of each of said plurality of functions at data points representing said received waveform; and

detecting an event using said derivative of each of said plurality of functions.

204. (Currently Amended) A computer program product for detecting an event on a wire comprising code that:

fits each of a plurality of functions to a portion of data points representing a received waveform, wherein each of said plurality of functions is a localized curve fitting of said portion of data points that approximates values of the data points in the portion;

determines a characteristic for each of said plurality of functions;  
evaluates said characteristic of each of said plurality of functions at data points  
representing said received waveform; and  
detects an event using said characteristic of each of said plurality of functions, wherein, if  
said event indicates a fault condition of said wire, said characteristic is used to identify a type of  
fault condition.

205. (Currently Amended) A computer program product for detecting an event on a wire  
comprising code that:

fits each of a plurality of polynomials to a portion of data points representing a received  
waveform, said portion of data points including a number of data points in accordance with a  
selected window size, wherein the data points included in said portion include a designated data  
point and a specified number of data points relative to said designated data point;

determines a characteristic for each of said plurality of polynomials;  
evaluates said characteristic of each of said plurality of polynomials at data points  
representing said received waveform; and  
detects an event using said characteristic of each of said plurality of polynomials.

206. (Currently Amended) A computer program product for detecting an event on a wire  
comprising code that:

fits each of a plurality of functions to a portion of data points representing a received  
waveform, wherein said fitting is a localized curve fitting technique utilized to smooth said data  
points;

determines a derivative for each of said plurality of functions;



evaluates said derivative of each of said plurality of functions at data points representing said received waveform; and

detects an event using said derivative of each of said plurality of functions.

207. (Previously Presented) The method of Claim 181, wherein said received waveform is one of: a swept frequency signal, a sine wave at a single frequency, a sine wave at a set of more than one frequency, a square pulse, and a step function pulse.

208. (Previously Presented) The method of Claim 181, wherein said detecting an event is performed in accordance with at least one statistical threshold.

209. (Previously Presented) The computer program product of Claim 193, wherein said received waveform is one of: a swept frequency signal, a sine wave at a single frequency, a sine wave at a set of more than one frequency, a square pulse, and a step function pulse.

210. (Previously Presented) The computer program product of Claim 193, wherein said executable code that detects an event is performed in accordance with at least one statistical threshold.

211. (New) The method of Claim 181, further comprising:

determining said characteristic for each of said plurality of functions; and  
evaluating said characteristic of each of said plurality of functions at data points representing said processed waveform.

212. (New) The computer program product of Claim 193, further comprising executable code that:

determines said characteristic for each of said plurality of functions; and

evaluates said characteristic of each of said plurality of functions at data points representing said processed waveform.